REMARKS/ARGUMENTS

Claims 1-6 are active in this application. Claim 1 has been clarified to make it clearer that the CaO-containing material is added in two parts, in the raw material mixture and the melting furnace, the amount added to the melting furnace not exceeding 40 kg per ton of molten iron. While this is believed to be apparent from the originally submitted claims, additional support for the amended claims is found on page 13, lines 3-14 and page 33, lines 1-14. As discussed in these pages, the claimed method provides a number of significant advantages such as smoother melting of the slag.

No new matter is believed to have been added by the amendments submitted herein.

There are several obviousness rejections raised in the Official Action. Before addressing those in detail, it would be helpful to discuss the invention and its advantages. As discussed on page 11 of the application, the amount of the slag generated in the melting furnace varies significantly depending on the grade or iron sources used as the raw material, and the amount of a CaO-containing material added into a melting furnace for controlling the slag basicity, for example, ranges of 20 to 150 kg per ton of molten iron. However, to reduce wear damage on the inner lining of the refractory, slag conditioning agents (such as CaO and MgO) must be added. However, what the Inventors have discovered (page 12) is that significant adverse effects on the operation of the furnace occur when the amount of a slag-conditioning agent added together with the solid reduced iron exceeds 40 kg per ton of molten iron. Therefore, by reducing the slag-conditioning agent (CaO) to not more than 40 kg per ton of molten iron and mixing the agent with the raw material, it is possible to accelerate the melting of the solid reduced iron and perform a smooth operation. As discussed on page 13, last ¶, even when the amount of the slag exceeds, for example, 300 kg

per ton of molten iron, it is possible to conduct melting in a smooth and reliable manner without melting inhibition of the slag former.

The art cited in the Official Action does not describe nor even remotely suggests the aspect of controlling the CaO material in this manner nor the advantages that result. Further details follow.

The rejection of Claims 1 and 6 under 35 USC 103(a) in view of US patent no. 6,251,156; the rejection of Claims 2-5 in view of US '156 and US '942; and Claims 1 and 6 in view of US patent publication 2001/0054329 (US pub '329) are respectfully traversed.

US '156 describes producing molten iron by heating compacts 19 in a rotary hearth furnace 28 where the compacts 19 include iron oxides 12 and/or iron bearing waster materials 22, reductants 14, slag formers 16 (such as SiO_2, CaO, Al_2O_3, CaF_2 and/or MgO), and a binder 18 (col. 3, lines 33-49). The materials are provided to tailor to specific compositions that influence desulfuization of the bath and further specify that the C/S ratio is from 0.5 to 2.2 (see Table 2 in col. 4). Based on this disclosure, the Office takes the position that since US '156 alleges teaches that the amount of CaO is a result effective variable, it would have been obvious to limit the amount of CaO added to the melting furnace (see page 4 of the Official Action).

However, what is missing from the disclosure of US '156 is disclosure for adding CaO in two portions, one in the raw material and the second added to the furnace directly, that second amount being limited to 40 kg per ton of molten iron. There is nothing in US '156 that suggests this methodology. Moreover, the art does not even address the problems identified by the inventors nor how one would devise a solution as has been found and discussed above. In particular, as discussed above in reference to the specification, by reducing the slag-conditioning agent (CaO) to not more than 40 kg per ton of molten iron and

mixing the agent with the raw material, it is possible to accelerate the melting of the solid reduced iron and perform a smooth operation while alleviating the melting inhibition caused by the slag former.

The addition of the '942 patent to reject Claims 2-5 also does not bring the art any closer to rendering the claims obvious. This is because the '942 patent when read with the '156 patent fails to describe or suggest adding CaO in two portions, one in the raw material and the second added to the furnace directly, that second amount being limited to 40 kg per ton of molten iron.

US pub '329 is a continuation-in-part of US '156 discussed above and for the purposes of the rejection describes essentially the same thing. Therefore, as is apparent from the discussion above pertaining to US '156, US pub '329 fails to describe or suggest adding CaO in two portions, one in the raw material and the second added to the furnace directly, that second amount being limited to 40 kg per ton of molten iron. Moreover, US pub '329 does not suggest by conducting the process in the manner that is claimed, it is possible to accelerate the melting of the solid reduced iron and perform a smooth operation while alleviating the melting inhibition caused by the slag former.

Accordingly, in view of the above, Applicants request withdrawal of the rejections based on US '156 alone and US '156 combined with US '942 as well as the rejection of Claims 1 and 6 in view of US pub '329.

The rejection of Claims 1 and 2 under 35 USC 103(a) in view of US patent publication 2001/0027701 (US pub '701) is respectfully traversed.

The method in this publication heats the formed raw material containing iron oxide and carbon reductant in an reducing melting furnace to reduce iron and charge the iron into a steelmaking furnace. CaO is blended with the formed raw material to the hearth of the reducing melting furnace in an amount to adjust the basicity of the slag too 0.6 – 1.8 (page 19, claims 1, 4, 5, 7 and 8). In addition, [0018] of US pub '701 describes the amount of Cao to be added to the raw material

As discussed above, the claimed method adds CaO in two portions, one in the raw material and the second added to the furnace directly, that second amount being limited to 40 kg per ton of molten iron. This is not at all described in US pub '701. Moreover, US pub '701 does not suggest by conducting the process in the manner that is claimed, it is possible to accelerate the melting of the solid reduced iron and perform a smooth operation while alleviating the melting inhibition caused by the slag former.

Accordingly, withdrawal of the rejection based on US pub '701 is requested.

The rejection of Claims 1 and 2 in view of Claims 1-3 and 7 of US patent no. 6,630,010 is respectfully traversed as well.

The claimed method adds CaO in two portions, one in the raw material and the second added to the furnace directly, that second amount being limited to 40 kg per ton of molten iron. This is not at all claimed, described or otherwise suggested by Claims 1-3 and 7 of the '010 patent. Notably, Claim 1 of the '010 patent describes adding CaO it does so in the raw material and includes a step for adjusting CaO to get a basicity value of 0.6 to 1.8. There is nothing here which adds CaO to the melting furnace and, moreover, which limits the CaO added to the melting furnace as set forth in the claims of the present application. As Claims 2, 3 and 7 of the '010 patent also fail to describe such a step in the method, Claims 1 and 2 of the present application would not have been obvious.

Withdrawal of this rejection is requested.

A Notice of Allowance for all pending claims is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, she is encouraged to contact Applicants' undersigned representative.

Respectfully submitted,

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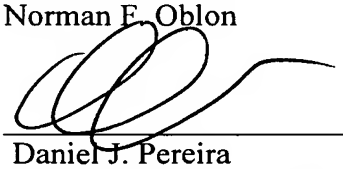

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